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FRAMEWORK of THE DOD LOGISTICS SYSTEM: EDUCATING LEADERS ON LOGISTICS

by

Lyndon S. Anderson, Lt Col, USAF

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Advisors: Dr. Glenn A. Gotz and BG (Ret) William Fedorochko, Jr.

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Preface

This research effort provided an invaluable opportunity for me to delve into the profession of military logistics. As an Air Force officer with 21 years of experience in logistics, I felt somewhat inadequate to move into positions that assist with the development and oversight of logistics policy at the major command, Air Staff or Joint Staff levels. My experiences and educational background shed little light on the integration of logistics support activities within the Air Force and among other military services. This revelation became most evident while serving as the Deputy Commander for Air Force Forces during Operation SHINING HOPE, the humanitarian relief effort for the 800,000-plus displaced Kosovo-Albanians in 1999. Logistics support by all the military services was provided by sheer determination and by the exhaustive efforts of well-meaning logisticians. Many made needless mistakes costing valuable time, energy and scarce resources. Education by trial and error was no way to learn the business.

I chose this topic for research because I wanted to maximize my opportunity to learn about military logistics during my one-year fellowship at the Institute for Defense Analyses. As with any new challenge, understanding the basics seemed like a logical starting point. Through my exploration of military logistics, I wanted to ultimately develop a better cognitive "big-picture" view of Department of Defense (DOD) logistics so I could categorize information for better recall during my logistics self-education process. Developing a framework for the DOD logistics system fit the bill.

I would like to thank Dr. Glenn A. Gotz and BG (Ret) William Fedorochko, Jr., at the Institute for Defense Analyses for serving as my respective academic and functional advisors. Dr. Gotz displayed exceptional wisdom and patience. He not only provided extraordinary guidance during my research, but through the process, helped shape my thoughts in a way that

allowed me to think more broadly about issues at the national and strategic levels. BG (Ret) Fedorochko's blunt but constructive feedback was always spot-on. He took time out of his horrendous schedule to help focus my research effort, and, in the end, to help me better understand why I was "in the swamp."

I would also like to thank my readers, Col Kenneth Knapp, Air Force Materiel Command Chair to Air University, and Col (S) James T. Silva, Weapons System Support Division, United States Special Operations Command for their frank and honest feedback. They provided superb recommendations that refined the paper, making it a much better product in the end.

Further, I extend warm and hearty thanks to Mr. Michael Leonard, Director of Strategy, Forces and Resources Division at the Institute for Defense Analyses, for this fellowship opportunity. He and his team of highly talented support and research staff members provided an exceptional atmosphere to conduct research and to learn the ins and outs of a federally funded research and development center.

Finally, my greatest thanks go to Trudy, my loving wife of 25 years. Her words of encouragement and support were always comforting and uplifting during this seemingly long and arduous process. She makes my life complete.

Abstract

This paper describes a framework of the DOD logistics system—a primer for logistics education. The framework functions as a tool providing a broad overarching structure that describes DOD logistics and its influence on military operations. It provides the reader with meaningful insights that may shape planning and facilitate more informed decision-making. The intended audience is field grade officers or DOD civilian equivalents attending joint professional military education. The framework considers four areas to help the reader think differently about logistics—integrated systems, core components, levels of operation and structure. The method of research included a literature search, the creation of a simple framework to capture the essence of logistics activities, the identification of essential elements and the description of their content and linkages to show how they collectively form an end-to-end system. An illustration is used to show the value of the framework as an educational tool. By educating the reader on the essential elements that frame DOD logistics activities, he or she may develop a broader perspective of logistics activities that enhance awareness and understanding. A recommendation is made to include the paper in the resident and non-resident curriculums for joint education at all Intermediate or Senior level professional military education institutions to introduce joint officers and DOD civilians to the profession of logistics.

Chapter 1

INTRODUCTION

My logisticians are a humorless lot…they know if my campaign fails, they are the first ones I will slay.

—Alexander the Great

Background

Effective generation and sustainment of combat power requires an education in the fundamental relationship among strategy, tactics and logistics. Military and civilian leaders should fully understand the role logistics plays as the enabling arm of this triad. Specifically, their continuing education should at some point focus on developing a better understanding of how DOD logistics supports operational forces. For instance, leaders should understand the essential parts of DOD logistics activities, how these activities fit together to form an integrated whole and how employment of logistics activities generate and sustain combat power.

Developing this understanding, however, is a difficult educational challenge. The shear magnitude of the DOD logistics system makes it difficult for leaders to fully grasp how the system functions. To illustrate size, the DOD logistics system consumed one-third of the DOD budget in FY2000, it employs nearly half of the DOD workforce (925,000 full-time logistics personnel plus another 350,000 military reserve personnel) and it is comprised of four Services—nine combatant commands and over 20 logistics commands and agencies.[1] Without an adequate understanding of the entire logistics system, the leader may lack proper perspective

or a common frame of understanding to effectively plan and employ combat forces and logistics support forces in military operations. These are serious obstacles to overcome.

To illustrate the importance of logistics, recent U.S. military operations during the conflicts with Iraq, Boznia-Herzogovina and Kosovo put DOD logistics activities through their paces in the 1990s. The buildup and sustainment for the Gulf War seemed nothing short of miraculous. Heroic efforts took place by end of the war to deploy 350,000 personnel, 12,400 tracked combat vehicles and 114,000-wheeled vehicles in support of the ground offensive alone. Support personnel served over 94 million meals, pumped 1 billion gallons of fuel and delivered 31,000 short tons of mail.[2] During the Boznia-Herzogovina conflict, logistics support succeeded despite incredibly difficult multinational coordination challenges. The US had to overcome the inability of allied nations to project and support themselves outside their established areas of responsibility.[3] During the Kosovo conflict, logistics support assured the successful conduct of simultaneous combat and humanitarian operations. This was achieved despite conflicts and complexities not normally present when such operations occur independently of one another.[4]

The skill of US leaders in guiding logistics forces to achieve such feats of support was noteworthy. They understood how the activities of DOD logistics worked together to support military operations. They possessed the necessary knowledge and experience to successfully plan and execute logistics operations in support of each of the above campaigns. Future generations of US leaders must be able to do the same.

Purpose

The purpose of this paper is to gain meaningful insights, to influence planning and to facilitate more informed decision-making by providing a tool that describes a framework of the DOD logistics system. The framework has two goals. First, regardless of military service or

organizational background, the framework should help the reader think simply and sensibly about how the activities of DOD logistics influence combat effectiveness. Second, the framework should help the reader influence how logistics activities within his or her control can improve the generation and sustainment of combat power.

The framework presents a generic, holistic and objective view of the current DOD logistics system. Its focus is on the logistics activities that generate and sustain combat forces. It does not advocate any particular military service or concept of operation and leaves value judgments of the system to the reader.

Why A Framework Is Useful

The intended use of the framework of the DOD logistics system is to serve as a broad-based overview of DOD logistics for the field grade officer or DOD civilian equivalent attending joint professional military education. The joint educational curriculum addresses joint and combined operations and how to plan, generate, employ and sustain combat forces in support of national objectives. The framework for the DOD logistics system can compliment this curriculum. It does so by helping officers and civilians with diverse backgrounds and experiences think about logistics as a structured, interconnected, end-to-end supporting system. The framework's usefulness is underscored by answers to the following questions. How should the framework for the DOD logistics system change the reader's thinking about logistics and its role in military operations? And how can this change in thinking influence the generation and sustainment of combat power?

How Should the Framework for the DOD Logistics System Change the Reader's Thinking?

One of the underlying aims of the framework for the DOD logistics system is to help the reader think about logistics in a simple, logical way. By focusing on essential elements, the framework strips away the mountain of details that cause confusion and hamper understanding. The result is a more holistic view of DOD logistics activities that describe how the essential elements fit together to form a connected end-to-end system. The framework's holistic view provides a broader perspective of DOD logistics activities. It links the national economy with combat capability by describing a logistics system that transcends military service and organizational lines. Understanding these links and how they fit together should provide the necessary context and points of view that will help the reader better grasp and apply logistics products and capabilities to the task of generating and sustaining military operations. The framework considers four areas—integrated systems, core components, levels of operation and structure—to help the reader think differently about logistics.

First, the framework helps the reader to think about logistics activities as an integrated system made up of inputs, a conversion process and outputs. The framework describes inputs as the goods, services and information used to feed the logistics system. It then explains the core components and levels of logistics operations that work together to convert input into useful output. It finally shows how output products and capabilities of DOD logistics serve as the enabling input for operational forces.

Second, the framework helps the reader to think about the core components that make up logistics activities within the system's conversion process. The core components are enablers, competencies, conditions and command. Enablers are the resources, organization, infrastructure and technology that empower logistics operations. Competencies are the processes, functions and missions that produce the system's end products and capabilities. Conditions are the

physical and ideological environments that surround, guide and shape the system. Command is the controlling authority that bounds and unifies the system. Together, they make up the foundational parts of the system's conversion process.

Third, the framework helps the reader to think about DOD logistics activities at the national, theater and unit levels of operation. National-level logistics involve those DOD activities that prescribe policy and procedures; develop strategy, doctrine and directives; and oversee strategic-level logistic activities. Theater-level logistics activities plan and execute operations that generate and support combat forces in a particular geographic location. Unit-level logistics include those activities that provide direct support to operational forces.

Finally, the framework helps the reader to think about logistics in a more structured way. The logistics system is presented as a figurative pipeline that serves as a cognitive roadmap to bring order and structure to a large and complex system.

How Can A Change in Thinking Influence the Generation and Sustainment of Combat Power?

The ultimate goal of the framework for the DOD Logistics System is to enable readers to gain a better and broader understanding of logistics. By educating them on the essential elements that frame the DOD logistics system, they may develop a broader perspective of logistics activities that enhance awareness and understanding. A broader perspective and understanding of DOD logistics can help in a couple of important ways. First, it provides insights that lead to a more thorough analysis and scrutiny of important logistics actions. Such scrutiny facilitates discernment, which leads to better decision-making. Second, it reveals dependencies and relationships. Understanding these dependencies and relationships helps one assess situations more accurately, balance limited resources with operational requirements and

influence operational and campaign planning to function within the bounds of feasible logistics capabilities.

Paper Layout

The remainder of this paper is dedicated to the development and description of this framework. Chapter Two describes the framework of the DOD logistics system. The framework breaks down the activities of DOD logistics into their most basic parts. It describes the economy, strategy and requirements that make up the system's input, the core components and levels of operation that serve as the system's conversion process and the products and capabilities of the system that serve as its output. The chapter goes on to describe how these essential elements fit together to form the basic components of DOD logistics. Next, Chapter 3 discusses the value of the framework. It provides an illustration that describes the framework's use. It also explains how the framework can provide meaningful insight to the reader and influence war planning. The final chapter offers conclusions and recommendations.

Notes

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[3] *Boznia-Herzogovina After Action Review.* Conference Report. Carlisle Barracks, Pennsylvania: US Army Peacekeeping Institute, 19-23 May 96. Pg 18.

[4] *Kosovo/Operation ALLIED FORCE After Action Report*. Report to Congress, 31 January 2000. Pg 104.

Chapter 2

FRAMEWORK OF THE DOD LOGISTICS SYSTEM

Logistics…as vital to military success as daily food is to daily work.

—Captain Alfred Thayer Mahan

The purpose of logistics in the Department of Defense is to create and sustain support for combat forces to provide the physical means to exercise power.[1] This support is generated by a series of activities that make up DOD logistics. This chapter will look at these activities more closely to identify and describe their component parts, and to show how they fit together to satisfy military operational needs.

The activities of DOD logistics will be examined in the context of a system. The diagram at Figure 1 shows the generic framework of the DOD logistics system. It is composed of three primary segments: System Input, Conversion Process and System Output. The framework can be thought of as a pipeline that converts and channels input goods and services into useful products and capabilities necessary to generate and sustain combat power. The chapter starts with a brief explanation of the inputs that furnish and guide DOD logistics activities. Next, the chapter provides a comprehensive discussion of the DOD logistics activities that convert raw input into beneficial output. Last, the chapter briefly examines the output products and capabilities from the system showing how they relate to military operations.

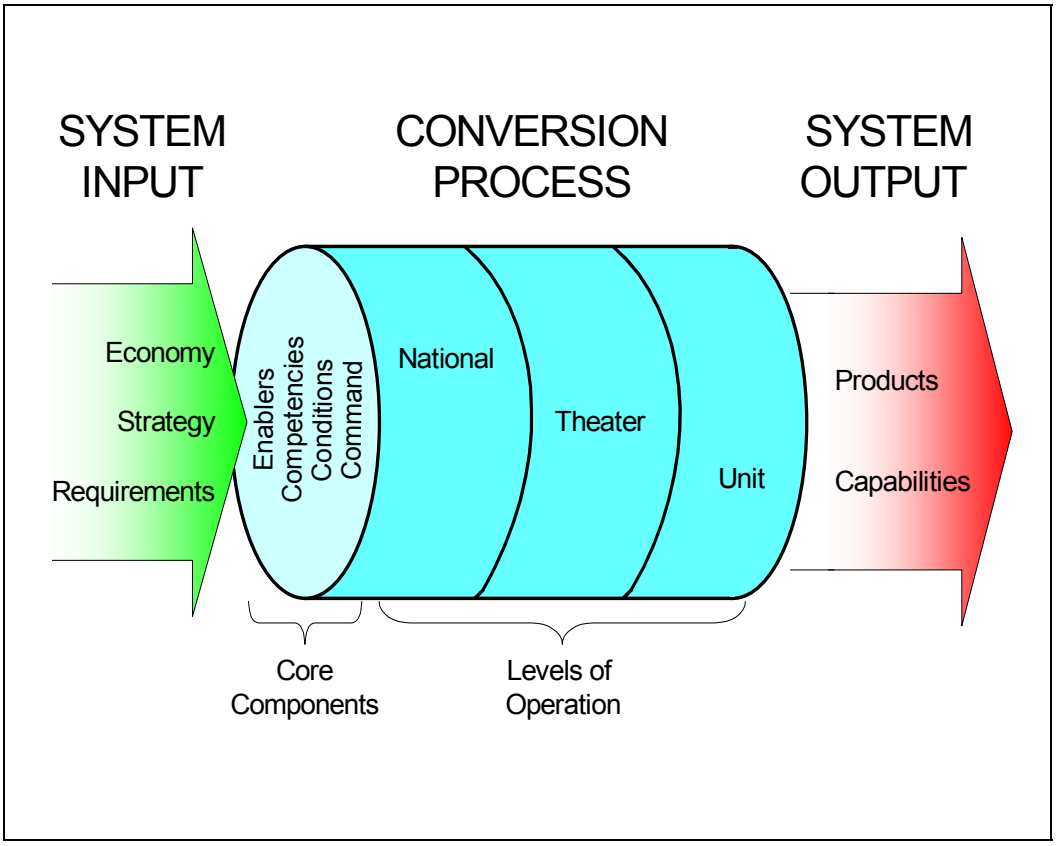

Figure 1. Framework of the DOD Logistics System

System Input

System inputs are an important first step in the examination of the DOD logistics system. Inputs take the form of goods and services that come from the nation's economy and information that comes from strategy and requirements. In a general sense, requirements identify the need, economy produces the goods and services and strategy provides the broad overarching guidance.

Requirements identify and communicate needs of the military forces. They are the specific pieces of information that engage logistics activities and the procurement process. Operational forces drive requirements by identifying the need for specific products and capabilities. Requirements that identify a particular product specify what, when, where and how much of that product is needed. Requirements that identify a particular capability express it as a desired ability or set of conditions necessary to enhance the war fighter's combat effectiveness.

Oversight of the requirements process is critical in the joint environment. The purpose of the requirements process is to place a demand on the logistics system. The leader's challenge is to ensure an efficient process is in place among the military services to understand the requirement and then to transmit the requirement to a supplier in an accurate and timely manner. Once requirements get to the supplier then the economy's pipeline starts to flow.

The national economy is made up of the nation's institutions of education, industry, labor and finance. Together, these institutions and the political and social system that undergird them produce the goods and services that feed the DOD logistics system.[2] The military relies on the vast resources, capability and industrial might of the nation's economy to produce the food, fuel, water, ammunition, weapon systems, clothing, repair parts, administrative supplies and medical products necessary to effectively wage war.

Strategy is generally broad national-level guidance used to provide direction for how the nation will employ military power. Strategy serves to shape and prepare military forces for the challenges and opportunities that await them in the future. Without it, the military lacks proper focus and sense of direction on when, how and why to use its forces.

Accordingly, within the bounds of strategic directives, the leader should be able to comprehend how requirements engage the economy generating goods and services that feed DOD logistics.

The Conversion Process

The logistics activities of each military service, the Defense Logistics Agency (DLA), United States Transportation Command (USTRANSCOM) and combatant commands comprise DOD logistics. These activities convert input goods, services and information into output products and capabilities.

The size and complexity of these conversion activities make it difficult to conceptualize its end-to-end operations, its major components, or how they fit together to achieve the desired effect for the war fighter. For instance, it is difficult to comprehend all the DOD logistics activities need to acquire, produce, sustain and dispose of every weapon system, large and small, for each of the military services. It is equally difficult to imagine all the activities involved in the procurement and distribution of food, fuel, ammunition and water to sustain military operations, and the assembly and sustainment of combat and support bases, living quarters and production facilities worldwide. The framework will therefore be used to make sense of this massive operation.

Explanation of Core Components

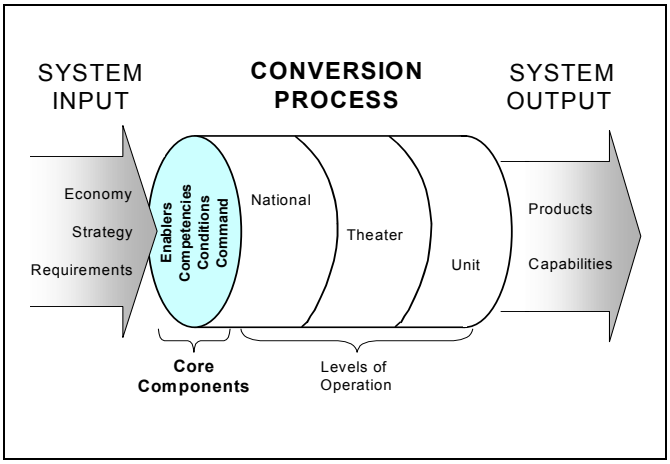

Figure 2. Conversion Process Core Components

The core components of the logistics system consist of the behaviors and actions that make up logistics activities at the national, theater and unit levels of operation. As shown in Figure 2, these components are Enablers—the items that empower the system; Competencies—processes, functions and missions that produce the products and capabilities of the system; Conditions—the activities that guide and bound the system; and Command—the authority and control exercised over the system.

Enablers. Enablers are the resources, organizations, infrastructure and technology that empower the system. They perform a dual role by serving as the primary enablers of the logistics system on the one hand and by limiting the system by realities of availability on the other.

Resources serve as an enabler of the logistics system through its people, funding and equipment. An effective logistics system requires people who are properly trained and motivated to operate within their own military service or organization logistics activities. It also requires people who are properly educated to understand the breadth and depth of joint and combined logistics activities across multiple levels of operation and across the full spectrum of conflict. Funding provides the purchase power necessary to procure or obtain items of need. The programming, planning and budgeting process affords staffs, military services and combatant commands the opportunity to forecast and request funding to accomplish assigned roles and missions. Equipment provides the necessary tools of the logistics system. Primary equipment includes transport vehicles (air, land and sea crafts) used for strategic and theater lift and information technology systems (communication, information and computer systems) used to move voice, data and other forms of information electronically. Test and support equipment covers a broad area of specialized gear used to assure effective and economical support of primary equipment and to aid users with performing specific logistics tasks.[3] Materiel handling, dunnage, test equipment and tools, medical support and food preparation are examples of different types of test and support equipment.

People, funding and equipment require considerable management expertise. In the case of people, expertise may vary considerably among the military services or organizations to which they belong. For example, airmen should know how to effectively deploy and re-deploy

expeditionary air forces. Sailors and marines should know how to successfully provide logistics support at sea and over the shore. Soldiers should know how to competently move and support massive ground forces over land. Together, they should all know the fundamentals associated with strategic and theater lift, port control, distribution systems, war readiness and reserve materiel responsibilities, host nation support and the like. This knowledge is necessary so logistics activities among the military services, DLA, USTRANSCOM and combatant commands can be fully integrated into the planning and execution of military operations. In the area of funding, leaders need to make tough fiscal recommendations and decisions to balance efficiency with effectiveness within each of the military services, combatant commands and other organizations. Though the methods vary, each military service must validate and prioritize needs to get the most from every taxpayer's dollar. This requires careful upfront planning and programming to help the decision-maker exercise prudence as he or she manages this limited resource. In the area of information systems, leaders must be able to fully exploit technology within the bounds of sensible returns to satisfy the needs of their organization's logistics activities. Like with any resource, wise leaders can take full advantage of information technology if they develop the necessary skills to manage it confidently and competently.[4] Specialized equipment requires the same degree of attention. Materiel Handling Equipment, for example, must be considered in the planning process to ensure ports can handle the on-load and off-load of strategic and theater lift vehicles. In sum, leaders should understand and use available resources to integrate the logistics activities of each military service, DLA, USTRANSCOM and combatant commands across the full range of military operations to achieve desired combat effectiveness.

Organizations enable logistics activities through their structure and culture. Organizational structure is the systematic order or arrangement of operations and activities and their interrelationships with one another.[5] Since the staffs, military services and combatant commands are responsible for their own organizational structure, it is important that leaders know what the structure is intended to achieve. Organizational structure defines division of labor, establishes hierarchy of order, specifies a system of control, identifies flow of information and communication and provides continuity across generations of organizational change.[6]

Organizational culture refers to the pattern of shared basic assumptions that affect the way one perceives, thinks and feels about the organization.[7] Understanding the culture of logistics activities within the staffs, military services and combatant commands helps a leader better anticipate and overcome cultural issues within the organizations. It also helps the leader identify differences among the organizations and pinpoint unwanted affects of resistance to change.

Collectively, organizational structure and culture are closely linked with authority and responsibility. If there is confusion about authority and responsibility, then the organization is probably at fault.[8] Leaders must therefore be sensitive to the structural and cultural differences among the staffs, military services and combatant commands. Because the logistics activities differ among these organizations, it is reasonable to expect the structure and culture of these organizations to differ as well. Understanding these differences helps the leader communicate and coordinate authority and responsibility more efficiently and effectively. They consume less time and energy trying to overcome perceived obstacles. In short, a thorough understanding of organizational structure and culture can lead to successful organizational integration.[9]

Infrastructure functions as an enabler of the logistics system through the use of real property and the industrial base. Real property includes such things as bases, posts, camps, stations, depots, office buildings, living quarters, distribution centers, aerial ports and seaports. It also includes pavement, roadways, railways, pipelines, real estate, storage facilities, utility systems, warehouses and the like. The industrial base consists of government-owned and civilian-owned production facilities, materials, labor, capital, and contributory items and services necessary to support the national military objectives.

Infrastructure is important to consider for two reasons. First, logistics infrastructure consumes an enormous amount of resources to operate and support. Inefficient, cumbersome, obsolete or expensive infrastructure drains an organization of valuable and limited resources. Attention in this area can yield substantial savings that could be used paying for other things such as force modernization.[10] Second, infrastructure is critical to effectively mobilize and sustain operational forces. Moving forces of personnel and equipment into an area of operation is only possible if sufficient aerial ports, seaports, roads and rail networks are available to support the deployment, reception, staging, onward movement, integration and sustainment of those forces.[11] Inadequate infrastructure to move forces into a theater of operation and sustain operational activities can seriously jeopardize a commander's ability to generate combat power. Careful up-front planning may help anticipate and overcome potential infrastructure shortfalls.

Technology serves as an enabler of the logistics system by enhancing its capabilities. It involves advances in the systems and equipment used by the activities of logistics. Dedicating resources to examine and develop new technologies is a necessary investment for the future. Such investment can reap huge dividends by improving the efficiency and effectiveness of logistics processes. Ignoring technological advances can cause considerable inefficiencies by

continuing to depend on increasingly obsolete equipment and by consuming limited resources unnecessarily.

Technology, when properly exploited, can serve as a force multiplier. For example, the technological advances in information systems have automated many logistics processes including command and control, requisitioning processes and stock control functions. Such automation reduces lead-time to produce an item, enhances in-transit visibility through the distribution pipeline and improves response time to get the item to the user. Education, integration, logistics footprint and vulnerabilities are just a few areas to consider when examining new technologies for application to current logistics processes.[12] The real challenge for a leader is to determine how best to exploit new technologies within a theater of operation to herd and integrate the myriad of military service and organizational activities in a common direction to achieve mutual objectives.

Competencies. Competencies are the second core component of the Conversion Process. They are the processes, functions and missions of logistics activities that produce the system's output products and capabilities. Competencies are listed at Figure 3. The nine major logistics processes are the overarching methods, practices and procedures that generate and sustain combat power. These processes are accomplished by organizations with assigned functions and missions. Functions are the stovepiped logistics responsibilities of an organization. Eight functional responsibilities are included in Figure 3. Within each organization, specific functional-related missions are assigned. Figure 3 links the specific missions to functional responsibilities. These missions serve as the bridging mechanism that links the organization's function with the broader processes it supports.

Notes

[1] Eccles, RADM (Ret) Henry E. *Logistics in the National Defense.* Harrisburg, Pennsylvania: The Stackpole Company, 1959. Reprinted. Newport, Rhode Island: Naval War College Press, 1997. Pg 22.

[2] Eccles, Pg 54.

[3] Blanchard, Benjamin S. *Logistics Engineering and Management.* 4th ed. Englewood Cliffs, New Jersey: Prentice Hall, 1992. Pg 11.

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[7] Schein, Edgar H. *Organizational Culture and Leadership.* 2nd ed. San Francisco, CA: Jossey-Bass Publishers, 1992. Pg 12.

[8] Eccles, Pg 219.

[9] Adapted from the section on why one needs to understand culture, Schein, Pg xii-xiv.

[10] RAND QDR Conference Proceedings. "Infrastructure Reform: Golden Goose or False Hope?." *Defense Issues*, 1997. On-line. Internet 8 March 2002. Available from http://www.rand.org/publications/CF/CF133. Pg 1.

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Logistics Processes[1]	
Programming, Planning, Requisition, Procurement and Contracting, Distribution, Sustainment, Disposition (evacuation), Deployment and Redeployment	
Organizational Functions and Missions[2]	
Supply	Requisition, Receive, Store, Control, Issue
Maintenance and Salvage	Retain, Restore, Repair
Transportation	STRATEGIC LIFT, DEPLOYMENT, REDEPLOYMENT, AIR/SEA PORT MANAGEMENT
Civil Engineering	Facilities, Roads, Land, Utilities
Support[3]	Program, Plan, Train, Educate
Health Services	Care, Treatment, Hospitalization, Evacuation, Medical Supplies and Materiel
Other Services	Food, Exchange, Clothing, Laundry, Billeting, Finance, Religion, Postal, Personal Hygiene (toiletry/showers)
Mortuary Affairs	Search, Identify, Recover, Prepare and Dispose of Remains

Figure 3. Competencies of the Conversion Process

The major processes of the logistics system are accomplished through organizational functions and their assigned missions. Some organizations have functional responsibilities and missions that directly support one or more of the logistics processes. These organizations include those assigned specific responsibilities in the functional areas of Supply, Maintenance and Salvage, Transportation, Civil Engineering and Support. Other organizational functions,

such as Health Services, Other Services and Mortuary Affairs, provide support in a less direct way. They provide services to the people that make up an organization regardless of its function, mission or process. They have the weighty responsibility of ensuring all personnel (support and operational forces alike) remain physically, psychologically and spiritually healthy, fit and ready to accomplish their assigned task.

Competencies require careful consideration. Competencies vary between the military services, combatant commands and other DOD organizations. Some functions or missions may not be required or only minimally so within a military service, command or organization, while others may be grouped differently or defined differently to accommodate specialized needs. Regardless of what competencies exist and how they are defined, logistics activities from all supporting organizations must blend together in a theater of operation to provide the combatant commander with effective logistics support. Marrying these competencies together is one challenge of the leader. Leaders must work within the bounds of each military service and other logistics organizations to ensure their logistics activities provide smooth flow of forces and equipment to support operational requirements. This requires a viable communication system to allow requisitions to flow out and a responsive distribution system to ensure goods and services flow in. The competencies of the four military services, USTRANSCOM and the DLA need to work in concert with one another to make this happen. The leader acts as a conductor of sorts integrating this complex group of activities together to achieve the desires of the combatant commander.

Conditions. Conditions are the third core component of the Conversion Process. Conditions are the physical and ideological environments within which logistics activities

operate. Physical conditions impose limitations on logistics that constrain operations; ideological conditions provide guidance and focus that enhance operations.

Consideration of the physical environment helps the leader recognize, plan and adapt to the restrictions the environment imposes on military operations. These conditions generate many concerns for the leader. For example, what climatic conditions exist that could hamper logistics operations? What affect will terrain—open seas, littorals, deserts, mountains, jungles, ravines and urban areas—have on logistics support? Logistics activities must be able to operate effectively regardless of the physical environment. Thorough analysis of terrain, weather patterns, climatic conditions and the like, and careful up-front planning will help minimize the constraining influence physical conditions can have on logistics support.

History, principles and attributes are the components that make up the ideological environment of logistics. They are like guideposts that channel the energies of logistics along a particular path. They provide purpose and direction. They form the conscience of logistics by shaping the leader's thoughts as he or she establishes the rules, policies, goals and expectations that govern how logistics activities will operate.

Each component has an important role to play. History provides the leader with perspective. It prevents the leader from having to "reinvent the wheel" by recognizing mistakes of the past and by pulling the best of the past forward to apply to the logistics processes of today and tomorrow. Historical literature covering the conduct of war or the execution of logistics provide nuggets of fundamental truths valid and relevant to problems faced in today's fast-paced techno-powered world. Likewise, archives of lessons learned from past campaigns offer yet another source of relevant information to guide the military leaders. Colonel Gene S. Bartlow puts knowledge of history in proper context when he said, "unless leaders grasp the events of the

past, the difficulties of the present are distorted and the successes of the future may be delayed indefinitely."[4]

Principles are the basic truths of military logistics hard learned from past experiences (See Appendix A for a limited list of current and past logistics principles). They help sensitize the leader to potential problem areas or to those areas that require special attention. Principles are codified in doctrine. Joint Publication 1, Joint Warfare of the Armed Forces of the United States, defines military doctrine as "fundamental principles that guide the employment of forces." JP-1 states that doctrine provides "authoritative guidance, based upon extant capabilities of the Armed Forces." "It incorporates time-tested principles for successful military action as well as contemporary lessons which together guide aggressive exploitation of US advantages against adversary vulnerabilities." In short, "doctrine shapes the way the Armed Forces think about the use of the military instrument of national power."[5]

Attributes are the idealistic standards of logistics usually derived from past historical lessons or from sound logistics principles. The six attributes of logistics, as suggested in DOD logistics strategy and transformation documents, and Joint and military service vision documents, are Responsiveness, Cost-effectiveness, Adaptability, Survivability, Interoperability and Feasibility.[6] Leaders can use them as aim points to plan and employ logistics forces.

Combatant commanders use conditions to establish logistics guidance. The combatant commander will weave in the realities of the physical environment and the knowledge gained from history, principles and attributes, with his personal experiences to develop guidance for the logistics activities under his or her control. This guidance will serve as the basis for policy, regulations and procedures produced by the joint officer or civilian equivalent. To do their job effectively, these leaders must be able to understand and relate to the logic of the combatant

commander thereby ensuring the commander's guidance is properly communicated and followed.

Command. Command is the Conversion Process's fourth core component. It is the critical unifying component of the logistics system because it "…transforms war potential into combat power by its control and use of the logistic process."[7] All the components of the logistics system are tied together using the processes of command and control, the concepts of lines of authority and responsibility, and unity of command.

Command and control is the primary means the commander uses to exercise his or her command authority. It is necessary for several reasons. First, it provides flexibility by responding to shifts in focus from among competing force operations or by adjusting to changes in mission. Second, it can oversee and manage logistics operations involving multiple logistics activities from the military services, and other logistics staffs and organizations. Third, by virtue of being the nerve center for logistics, it is a vulnerability that invites attack by an enemy.[8] And fourth, it integrates and controls the activities of the logistics system by providing specific direction over the processes, functions and missions of logistics activities; assessing risk; establishing priorities; monitoring and measuring efficiencies and effectiveness; and integrating, unifying and balancing capability with requirements across the dimensions of time and space.

Command and control over logistics forces occurs within two military command lines of authority and responsibility. Under the military service line, command and control runs along the chain of command from the Secretary of Defense through the military service secretaries and major commands to operational units. Their focus is, among other things, to organize, train and equip forces for use by combatant commands.[9] Along the combatant command line, the chain of command runs from the Secretary of Defense, through the combatant commander to combat

units. The focus of this command relationship is to prescribe and establish force structure to conduct military operations.[10] Together, the intent of these command relationships is to establish clear but separate lines of authority and responsibility for command and control of forces in preparation for military operations (military services) and command and control of forces to perform military operations (combatant commands). The logistics commander operates within both lines of authority and responsibility. During peacetime the commander and his forces generally fall under the military services for daily operations. During contingency or war, the logistics commander may be tasked to generate and sustain combat capability for a combatant command to accomplish its assigned operational mission.

Closely linked with lines of authority and responsibility is the concept of unity of command. Unity of Command (and the related concept of unity of effort) is central to effective control of logistics activities. Unity of Command means that all forces operate under a single commander with the necessary authority to direct all forces employed in pursuit of a common purpose.[11] Its goal is to ensure unity of effort under one responsible commander. Unity of effort—coordination through cooperation and common interests—is an essential complement to unity of command. It requires coordination and cooperation among all forces toward a commonly recognized objective.[12]

Effective command of logistics forces requires the commander to exercise proper control and authority of his or her forces. Successful commanders thoroughly understand their command and control system and how to exploit it, the source and responsibilities of their authority and how to exercise it and the concept of unity of command and how to observe it.

The leader plays an important role by ensuring processes are in place that enables the commander to exercise his or her authority. Clear and direct methods for communications must

exist to ensure the commander's intent and directions are conveyed. This is especially important when crossing military service lines where differences in culture and a lack of a common frame of reference can inhibit effective communication and coordination. Evaluating performance of logistics activities is another critical area to monitor. The commander must know whether logistics activities are providing effective support to operational forces. Consumption of materiel and expendables, port throughput, monitoring choke-points, weapon system readiness, customer wait times, pipeline asset visibility are examples of areas that may require special attention by the leader. Assessing risk to balance limited resources against operational needs is yet another area of crucial importance. The leader's challenge is to ensure thorough and objective assessments of problem areas that occur. This must be done in a timely manner to produce recommendations that point toward achieving desired combat effectiveness. Likewise, the leader must ensure a process exists to effectively assess, establish and communicate priorities when demand exceeds available supply. Finally, the leader has a responsibility to think ahead for the commander anticipating potential problem areas before they occur. To sum up, the leader must understand the processes and concepts used by command to provide the commander timely, objective, relevant and feasible recommendations that maximize logistics support for the war fighter.

Explanation of Levels of Operation

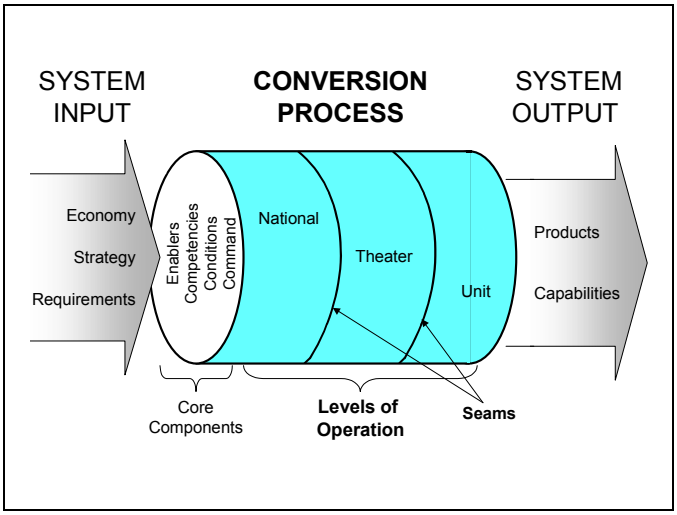

Figure 4. Conversion Process Levels of Operation

The second major part of the Conversion Process is its levels of operation. Figure 4 shows the three operational levels. All activities of the Conversion Process occur at one of these levels. Core components work together within each level of operation and along the logistics pipeline to channel logistics support to operational forces. Logistics activities combine the core components of enablers, competencies, conditions and command at each operational level producing competencies that generate products and capabilities. These activities are then employed in different ways at the national-, theater- and unit-levels of operation to satisfy requirements levied on the system. A brief description each level of operation is presented next along with a discussion on seams—joints between each level that can inhibit the smooth flow of items across logistics support activities.

National-level Logistics. National-level logistics are those DOD and joint logistics activities outside the scope and control of military services and combatant commands. National-level logistics involves the creation and support of defense logistics activities through organization, planning, execution and supervision. Its purpose is to prescribe policy and

procedures for the conduct of subordinate logistics activities. This is done through development of strategy, doctrine and directives; by establishment and review of plans, programs and budgets; and through the administration and oversight of strategic logistics processes. National-level logistics activities are found within the Office of the Secretary of Defense, management levels of the Joint Staff, military services, the DLA and USTRANSCOM. A brief description of each follows. A more comprehensive list of their roles and responsibilities is found at Appendix B.

Within the Office of the Secretary of Defense is the Deputy Under Secretary of Defense for Logistics and Materiel Readiness (DUSD L&MR). As a civilian political appointee, he or she serves as the principal staff assistant and advisor on the Department's logistics and materiel readiness activities to the Secretary of Defense, Deputy Secretary of Defense and Under Secretary of Defense for Acquisition, Technology and Logistics (AT&L). As the principal logistics official within the senior management of the DOD, the DUSD L&MR works with other deputy under secretaries within AT&L prescribing policies and procedures for the conduct of logistics, maintenance, materiel readiness and sustainment support.[13]

The senior logistician on the Joint Staff is the Director for Logistics (JCS/J4). The Director for Logistics, a military officer of 3-star rank, serves as the principal advisor to the Chairman of the Joint Chiefs of Staff. The Director's primary role is to provide strategic logistics integration by ensuring the logistics policies and plans of the military services and combatant commands are adequate. Through the staff, the Director also assesses the logistics impact of proposed and ongoing security assistance programs on logistics readiness of U.S. active and reserve component forces.[14]

Each of the military service headquarters includes a senior logistician and staff. Usually a military officer of 3-star rank is responsible to their military service Chiefs of Staff (or

equivalent) for logistics policy, planning, programming, budgeting, management, staff supervision, evaluation and oversight. Within each military service, their staffs work to align resources within programs and establish policy ensuring continuous design, development, integration and compliance of logistics activities to meet force requirements.[15]

The Defense Logistics Agency is a national-level logistics organization under the Office of the Secretary of Defense. The Director of the Defense Logistics Agency, a military officer of 3-star rank, reports to the Under Secretary of Defense for Acquisition, Technology and Logistics through the Deputy Under Secretary of Defense (Logistics and Materiel Readiness). Through the Director, the Agency is charged with providing effective and efficient worldwide logistics support to the military services and combatant commands, other DOD components, federal agencies, foreign governments and international organizations.[16] This vast organization operates both at home and abroad to supply nearly every common-use consumable item needed to support operational forces.

US Transportation Command is a unified command with a pure logistics role. Its senior logistician is the Deputy Commander in Chief, a military officer of 3-star rank. The Command's primary role is to provide air, land and sea transportation for the Department of Defense, both in peace and war.[17] The air component of USTRANSCOM is the Air Mobility Command (AMC). AMC is the single manager for air mobility with a mission of providing airlift, air refueling, special air missions and aeromedical evacuation for U.S. forces. The land component is the Military Traffic Management Command (MTMC). Its mission is to provide global surface transportation and traffic management service to meet national security objectives. The sea component is the Military Sealift Command (MSC). Its mission is to provide ocean transportation of equipment, fuel, supplies and ammunition to sustain U.S. forces.[18]

The senior logistics leaders within these organizations serve on the Joint Logistics Board and the Defense Logistics Executive Board coordinating improvement efforts within DOD logistics. They provide a more unified long-term focus for the DOD logistics community. Their primary focus is to advance the Secretary of Defense's initiative on logistics transformation and the Chairman's Joint Vision initiative on Focused Logistics.[19]

Understanding responsibilities of logistics organizations at the national level will help leaders to unite and integrate national-level logistics operations with theater-level logistics activities. For example, at the national-level, the leader may be responsible for recommending allocation of limited strategic lift assets to support a theater of operation. At the Theater-level the leader may recommend adjustments to the Time Phased Force Deployment List during the planning process to prioritize when forces enter the theater of operation. In either case, the leader will need to assist with coordination and integration of national-level logistics activities into military service logistics activities to ensure the combatant commander receives responsive, quality support.

Theater-level Logistics. Theater-level logistics involves the planning and execution of logistics operations to support military force in a particular geographic location. Its purpose is to apply logistics resources to generate, support and sustain theater combat power. Application of combat power rests with the combatant commands. Though each of the military services provide logistics resources, combatant commanders have the responsibility for ensuring that the overall plan for using these resources supports their specific theater needs.[20] Combatant commanders do this through the Theater Logistics System. Collectively, this system plans for and receives military forces and logistics support items and distributes them to operational or support units via

a distribution pipeline. A more detailed description of the Theater Logistics System is found at Appendix C.

The distribution pipeline is a channel through which DOD conducts distribution operations. In its larger context, the pipeline is a complex assemblage of integrated national- and theater-level activities that provide materiel, resources, information and communication to front-line operational forces.[21] The pipeline consists of two major parts. The first part, the strategic side of the distribution pipeline, consists of the national-level logistics providers—military services, DLA and USTRANSCOM. The Defense Logistics Agency provides common-use items to the combatant command. USTRANSCOM provides the strategic lift vehicles and facilities necessary to move forces and equipment from point of origin outside the theater of operation to air-, land- and sea-ports of debarkation within the theater of operation.

The second part of the pipeline consists of elements of the Theater Logistics System that extend from the port of debarkation to operational and support areas within theater.[22] The combatant commander has responsibility for planning and execution of the second part of the distribution pipeline. The commander does this using the combatant command's J-4 (or equivalent) staff; a Logistics Readiness Center; a group of Joint Logistics Offices, Boards and Centers; and military service component commands.

Each of these activities has specific responsibilities in support of theater logistics operations. The combatant command's J-4 staff has the responsibilities for developing logistics plans and for coordinating and supervising logistics activities. They ensure military service logistics activities are properly integrated with the commander's concept of logistics support. The Logistics Readiness Center serves as the hub of all joint logistics operations. It works with each of the military services to plan, monitor and coordinate logistics activities; to direct and

coordinate logistics support for future operations; and to advise the combatant commander on the supportability of proposed operations. The combatant commander may also use such activities as Joint Logistics Offices, Boards or Centers to centrally manage critical assets and to react more effectively to unexpected situations. These offices, boards or centers have as their objective the effective support of joint operations while attempting to achieve efficient support operations. Finally, the military service component commands implement, execute and control their own administrative and functional logistics activities. Unless otherwise provided, each military service is responsible for the logistics support of its own service.[23]

Keeping the products of the logistics system flowing through the distribution pipeline is of prime importance. To do this, leaders can ensure the processes each military service uses to request and fill necessary logistics support items exist in a way that provides efficient and effective combat support. For example, they must coordinate among theater- and national-level logistics activities to deconflict as well as prioritize limited strategic lift assets optimizing availability when moving forces into and out of theater. They must ensure forces flowing in and out of a theater don't overtax the capacity of airports, railheads and seaports. They must ensure port capabilities are maximized to efficiently off-load and store incoming forces and materiel and to move those forces and materiel into the intra-theater distribution pipeline. Finally, they must work with the host nation to maximize use of the nation's economy and infrastructure for such things as intra-theater transportation, fuel, food, lodging, security services and the like. In sum, the effort of these leaders should be to focus on integrating common logistics activities and to compliment military service-specific logistics activities that generate and sustain combat forces.

Unit-level Logistics. Unit-level logistics are logistics activities located in the United States and within a theater of operation that provides logistics support or combat service support

directly to operational forces. Logistics support forces provide the activities that directly support combat forces during home station or garrison operations. During peacetime, these logistics activities fall under the authority of their respective military services. They are typically assigned to or imbedded within an Air Force Wing, Army or Marine Corps Brigade or Navy Battle Group. Their task is to support their military service's Title 10 responsibilities of organizing, training and equipping forces in preparation for combat. Logistics support forces take on the role of combat service support forces during contingencies or during time of war. Their mission changes from preparing for combat to supporting combat. They fall under the authority of a combatant command and provide the necessary front-line capabilities and activities to generate and sustain combat forces within that theater of operation.

Other logistics support activities exist at the unit-level as well. Military service depots, research and development organizations and academic institutions are examples. Each supports the logistics activities of their respective military service, but are typically not assigned to a combatant command.

At this level, the leader focuses primarily on military service-specific issues. They are concerned about issues such as locating and erecting facilities and support bases and establishing stockpiles of materiel, expendables (fuel, food, water, ammunition and hardware) and equipment (spares, test and support equipment) to sustain a fighting force. They are also concerned with providing important quality of life services such as food, lodging, medical, postal, finance, laundry and religious activities. To maximize support to operational forces these leaders must ensure lines of communication remain open to communicate military service requirements up the chain of command to theater level and to ensure forces and materiel at their disposal are used frugally and wisely.

Seams Between Levels of Operations. The diagram of the Conversion Process's Levels of Operation at Figure 4 (Page 22) shows seams between each of the levels of operation. Seams are the major transfer or hand-off activities in the movement of forces, equipment and materiel from point of origin to point of use. Seams can inhibit the smooth flow of forces or can work so smoothly that operations appear seamless. Responsibility for these seams varies depending on their location. Typically, USTRANSCOM, as a national-level logistics activity, has responsibility for moving forces from originating locations to ports of embarkation or staging areas outside a theater of operation to ports of debarkation within a theater of operation. At this point, theater-level logistics activities take over responsibility for moving forces from ports of debarkation to assembly areas or directly to their final destinations. Unit-level logistics activities assume responsibility for moving forces from assembly areas to the point of use.

Seams can be a nemesis of the leader at any of these hand-off points if they are not properly managed. History is replete with examples where forces where delayed at the seams because the transfer activities were mismanaged or they lacked sufficient capability or capacity to handle the loads. Transfer activities at ports, staging areas and assembly areas are potential seams that require special attention.

Another way to express the concept of seams is to think about a logistics distribution network. At each location materiel must travel through a conduit that gets progressively smaller. At the large end is the nation's economy that can mass-produce items to fill military needs. This conduit feeds a smaller strategic lift conduit to move items into a theater of operation. As they enter the theater, items are transferred to even smaller conduits to move them to their final destinations. For example, the distribution of Meals Ready to Eat (MREs) arrives from suppliers in mass, distributed via strategic lift to CONUS and worldwide storage locations, and distributed

using theater lift and local transportation systems to the end user. At each transfer point, a hand-off of the items occurs that can cause potential delays if not accomplished in a smooth and efficient manner. Bottom line: leaders must be sensitive to these potential problem spots, especially in the planning process, to ensure sufficient capability and capacity exists to keep forces, materiel and equipment flowing smoothly from source of supply to point of use.

System Output

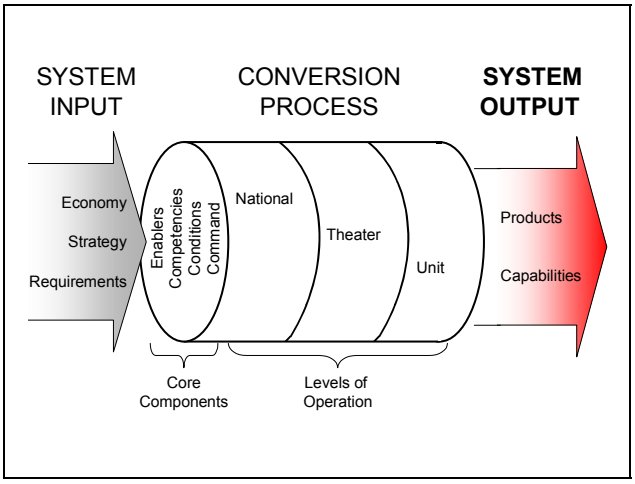

Figure 5. System Output

The output of the DOD logistics system, as shown in Figure 5, is its products and capabilities. Products of the logistics system are the goods and services that satisfy the requests and needs of operational forces. The five product categories are listed and defined at Figure 6 below.

Materiel—All items (including ships, tanks, self-propelled weapons, aircraft, etc., and related spares, repair parts, and support equipment) necessary to equip, operate, maintain, and support military activities [JP 1-02]

Services—Activities that enhance quality of life—food, lodging, medical, postal, finance, laundry, religious activities, etc.

Facilities—Real property consisting of builds, structures, utility systems, pavement, and underlying land [JP 1-02]

Equipment—all non-expendable items needed to outfit or equip an individual or organization [JP 1-02]

Expendables—Supplies which are consumed in use, such as ammunition, fuel, water, food, surgical dressings, drugs, medicines, etc., or which lose their identity such as spare parts, etc.

Figure 6. Products of the DOD Logistics System

When satisfying the end user's requests for logistics support, the delivery of a requested product is but one of four conditions that should exist to satisfy the users need. Other conditions include the consideration for time, location and quality. The end users may not be fully satisfied unless a product is delivered on time, at the right location and in the right quantity, quality and cost. Capabilities of the logistics system satisfy these considerations.

The capabilities of the logistics system is its ability to adapt and respond effectively to a user's need across the full range of military operations. A user's need is generally satisfied when all four conditions are met. How well the system as a whole is integrated from end-to-end to provide efficient and effective support to the end user dictates how well the system will respond to these conditions. The enablers, competencies, conditions and command elements of the logistics system work in concert with one another at the national, theater and unit levels to provide a balanced, integrated and responsive system that generates and sustains combat power for operational forces. Together, these products and capabilities make up the logistics system's output.

A relationship exists between the logistics system output and the operational forces input that the commander and logistician should thoroughly understand. The logistics system's responsive and adaptable output of logistics products (materiel, services, facilities, equipment and expendables) serves as the basic resources operational forces use to produce combat capability. That is, the logistics system provides the necessary resources that enable operational forces to generate and sustain combat power. Altogether, effective logistics support ensures that the combat arm of the military possesses the necessary means to conduct military operations.

Notes

[1] Procurement and Contracting, Distribution, Sustainment, and Disposition derived from Joint Publication (JP) 4-0. *Doctrine for Logistic Support of Joint Operations*. 6 April 2000. Pgs I-14 through I-17.

[2] JP 4-0, Pgs I-8 through I-14.

[3] JP 4-0 does not recognize Support as a function of logistics.

[4] Bartlow, Col Gene S. "The Operator-Logistician Disconnect." *Airpower Journal*, (Fall 1988): 23-37. On-line. Internet, 8 March 2002. Available from http://www.airpower.au.af.mil/airchronicles/apj/apj88/bartlow.html. Pg 3.

[5] Joint Publication (JP) 1. *Joint Warfare of the Armed Forces of the United States*, 14 November 2000. Pg 8.

[6] Compiled from statements taken from the following sources:

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US Department of Defense. *Logistics Functional Requirements Guide.* Washington, D.C.: Office of the Deputy Under Secretary of Defense for Logistics and Materiel Readiness, August 1998. On-line. Internet, 8 March 2002. Available from http://www.acq.osd. mil/log/programs/lfrg/lfrg.html;

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US Department of the Army. *The Army Vision: Soldiers on Point for the Nation; Persuasive in Peace, Invincible in War*. Washington, D.C.: Office of the Secretary of the Army, October 1999. On-line. Internet, 8 March 2002. Available from http://www.army.mil/vision/cd/docs/The_Army_Vision.PDF;

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US Department of the Navy. *Marine Corps Strategy 21.* Washington, D.C.: Office of the Commandant of the Marine Corps, July 1999. On-line. Internet, 8 March 2002. Available from http://www.usmc.mil/templateml.nsf/25241abbb036b230852569c4004eff0e/$FILE/strategy.pdf;

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US Coast Guard. *Coast Guard 2020: Ready Tomorrow… Preparing for Tomorrow.* Washington, D.C.: Office of the Commandant of the Coast Guard, May 1988. On-line. Internet, 8 March 2002. Available from http://www.dtic.mil/jv2020/cgsmcolor.pdf.

[7] Eccles, Pg 226.

[8] Coakley, Thomas P. *Command and Control for War and Peace*. Washington, D.C.: National Defense University Press, 1992. Pgs 6-7.

[9] Military services are responsible for recruiting; organizing; supplying; equipping (including research and development); training; servicing; mobilizing; demobilizing; administering (including the morale and welfare of personnel); maintaining; construction, outfit, and repair of military equipment; and the construction, maintenance, and repair of buildings, structures, and utilities and the acquisition of real property and interests in real property necessary to carry out the responsibilities specified in this section.

Armed Forces. US Code. Title 10. Subtitle B, Part 1, Chapter 303, Section 3010, Section 3013-Secretary of the Army;

Armed Forces. US Code. Title 10. Subtitle C, Part 1, Chapter 503, Section 5013-Secretary of the Navy;

Armed Forces. US Code. Title 10. Subtitle D, Part 1, Chapter 803, Section 8010, Section 8013-Secretary of the Air Force. On-line. Internet, 8 March 2002. Available from http://www4.law.cornell.edu/uscode/10/.

[10] *Armed Forces. US Code.* Title 10. Subtitle A, Part 1, Chapter 6, Section 161-Combatant Commands: Establishment. On-line. Internet, 8 March 2002. Available from http://www4.law.cornell.edu/uscode/10/.

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[11] Joint Publication (JP) 3-0. *Doctrine for Joint Operations*, 10 September 2001. Pg A-2, Para 6a.

[12] JP 3-0. Pg A-2, Para 6b.

[13] US Department of Defense (DoD) Directive 5134.12. *Deputy Under Secretary of Defense for Logistics and Materiel Readiness (DUSD (L&MR)).* 25 May 2000. On-line. Internet, 8 March 2002. Available from http://www.dtic.mil/whs/directives/corres/pdf/d513412_052500/d513412p.pdf. Pgs 1-2.

[14] US Department of Defense. *Mission.* Washington, D.C.: Office of the Joint Chiefs of Staff Logistics Directorate (J4), 9 August 2000. On-line. Internet, 8 March 2002. Available from http://www.dtic.mil/jcs/j4/about.html.

[15] US Department of the Air Force. *Mission Statement, Deputy Chief of Staff for Installation and Logistics*, Washington, D.C.: Office of the Deputy Air Force Chief of Staff for Installation and Logistics. On-line. Internet, 8 March 2002. Available from http://www.il.hq.af.mil/;

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[16] US Department of Defense (DoD) Directive 5105.22. *Defense Logistics Agency*. 6 Dec 88. On-line. Internet, 8 March 2002. Available from http://www.dtic.mil/whs/directives/corres/pdf/d510522_120688/d510522p.pdf. Pgs 1-2.

[17] US Department of Defense (DoD) Directive 5158.4. *United States Transportation Command*. 8 January 1993. On-line. Internet, 8 March 2002. Available from http://www.dtic.mil/whs/directives/corres/pdf/d51584_010893/d51584p.pdf. Pgs3-4.

[18] US Department of the Air Force. *Mission, Air Mobility Command.* Scott AFB: Headquarters, Air Mobility Command. On-line. Internet, 8 March 2002. Available from https://public.scott.af.mil/hqamc/index.html;

US Department of the Army. *Mission, Military Traffic Management Command*. Alexandria, VA: Office of the Military Traffic Management Command. On-line. Internet, 8 March 2002. Available from http://www.mtmc.army.mil/;

US Department of the Navy. *Mission, Military Sealift Command*. Washington, D.C.: Office of the Military Sealift Command. On-line. Internet, 8 March 2002. Available from http://www.msc.navy.mil/N00p/mission.htm.

[19] US Department of Defense. *Logistics Transformation Update, Focus and Accelerate.* Washington, D.C.: Office of the Deputy Under Secretary of Defense for Logistics and Materiel Readiness, January 2001. On-line. Internet, 8 March 2002. Available from

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http://www.acq.osd.mil/log/programs/logtransformation/log_trans-formation.pdf. Pg 2-1.

[20] JP 4-0. Pg IV-1.

[21] Joint Publication (JP) 4-01.4. *Joint Tactics, Techniques, and Procedures for Joint Theater Distribution.* 22 August 2000. Pg I-1.

[22] JP 4-01.4. Pg I-2.

[23] JP 4-01.4. Pg II-7-8.

Chapter 3

VALUE OF THE FRAMEWORK

The success of the commander does not arise from following rules or models. It consists in an absolute new comprehension of the dominant facts of the situation at the time and all the forces at work….

—Winston Churchill

The framework of the DOD logistics system presented in Chapter 2 described the essential elements that make up the logistics activities within the Department of Defense. The intent of the framework is to help the field grade officer or DOD civilian equivalent think more lucidly and prudently about logistics and how it supports combat operations. This chapter will express the value of the framework by first providing an example to show how it may be used. Next, the chapter describes how the framework provides meaningful insight through context and perspective that helps the reader better analyze logistics activities under his or her control. Finally, the chapter expresses how knowledge of the DOD logistics system may help the officer or DOD civilian balance means with ends during the planning process.

Using the Framework

An example may be helpful to illustrate how the framework is used. Suppose a Joint Task Force (JTF) is being established to conduct military operations on an island in the Pacific. The JTF commander has directed that his or her Director of Logistics (JTF/J4) provide a briefing on the logistics concept of operation supporting the task force's mission of providing peacekeeping operations following a period of civil unrest in the region.

How can the framework of the DOD logistics system help the JTF/J4 think through this task? It provides him or her with perspective to help focus thought. The framework provides a way of thinking about the essential elements that empower a logistics system and the organizational hierarchy that uses those elements to generate and sustain combat capability. Knowing what the essential elements are and how they fit together provides context and perspective that helps the user cognitively categorize the activities of logistics and retain their particular function.

The JTF/J4 and staff may start the task by reviewing the commander's guidance, military logistics doctrine, logistics principles and historical lessons learned. These items offer important information that can guide the thought process as the JTF/J4 develops a logistics concept of operation. Next, to gauge scope and size of the operation, the JTF/J4 may want to consider the geography, topography, climate, weather patterns, port availability, transportation network, among others, that exist in and around the island. The framework referred to these two sets of items as Conditions. In the case of the former, it stressed the importance of recognizing their affect on providing focus and guidance on the logistics system; in the case of the latter, it stressed their influence on imposing limitations and constraints on logistics support.

Armed with this knowledge, the JTF/J4 may proceed by following doctrinal guidance to steer the development of a logistics concept of operation. Doctrinal guidance suggests that the JTF/J4 concentrate on issues associated with logistics planning, force deployment, employment and sustainment and force redeployment activities. The framework's discussion on Competencies sheds light on the importance of understanding these major processes and how they and their associated functions and missions produce the logistics system's products and capabilities for the combat forces.

The JTF/J4, according to doctrinal guidance, should also consider key enablers such as resources, organization and facilities. The logistics concept of operation should acknowledge resource issues such as force configuration and availability, equipment accessibility and readiness, and related funding issues dealing for example with host nation support. Organizational considerations to identify the most effective theater logistic support structure should also be considered, as should facilities availability, condition, throughput capacity and the like. The framework's exposition on Enablers shed light on these issues and their affect on the logistics system.

Doctrinal guidance also suggests that the JTF/J4 focus on command and control. Questions that should be addressed include: what command and control capabilities exist; what are the command and control requirements; and will the designated command relationship provide for unity of command? The framework's section on Command discuss these issues and others, reminding the JTF/J4 and staff that command is the critical unifying component that transforms war potential into combat power.

The JTF/J4 will also want to know whom his theater-level staff needs to coordinate with among the national-level logistics providers (DLA and USTRANSCOM) and among the military services to integrate the flow of logistics products and capabilities into the theater of operation. This flow of logistics support and sustainment items must move smoothly and efficiently from point of origin, through the ports of debarkation, through the ports of embarkation and finally to the final destination at the unit level of operation. The framework offered discussions on Levels of Operation familiarizing the JTF/J4 with their roles and responsibilities. The framework also contained a discussion on the likely seams between each level of operation that can inhibit the smooth flow of forces and equipment.

This brief illustration points out that the framework's real value is not in its direct applicability to the user; rather, its value is appreciated in its indirect use as an educational tool to help the user better understand the essential elements that make up a military logistics system. From this, the user's broader understanding of military logistics can result in meaningful insights that influence planning and facilitate more informed decision-making.

Providing Meaningful Insight

The framework provides context and perspective to help the reader analyze logistics activities more critically. The reader can delve into logistics issues with confidence that their basic understanding of logistics is sufficient to help them ask more pertinent questions that target particular areas of interest. Their working knowledge of logistics may now be adequate enough to allow them to focus more intently on the issue at hand without spending unnecessary time and effort trying to comprehend the logistics circumstances that surround the issue. In short, they are better prepared to discern issues more quickly and more accurately. A tool that provides broader perspective leads one to be more astute about targeting the important issues. Meaningful insights result which, in the end, may influence planning and lead to better decision-making opportunities.

Influence on Planning

The framework may be useful in the area of war planning. An Airpower Journal article published 14 years ago sheds light on this subject. In his article The Operator-Logistician Disconnect, Colonel Gene S. Bartlow, USAF, argued that it is important for commanders and logisticians to understand that logistics is a critical element of the operational art of war. He said that logistics is possibly the least understood part of war planning. According to Bartlow, operational commanders do not understand the role of logistics in war because they do not fully

understand how logistics affects operations. For both the commander and the logistician, understanding the role of logistics helps the commander to factor logistics realism into plans and concepts.[1] To do this, Bartlow believed that war planners (commanders and logisticians alike) must understand the difference between what to think (training) and how to think (education) as they plan logistics support for operational forces.[2] Doctrine and experience serves as a tool that can govern what to think regarding logistics, the framework of the DOD logistics system serves as a tool that can govern how to think about logistics.

The framework helps the reader think about the role logistics plays in supporting military operations. It shows that logistics provides the means to generate and sustain operational forces. The framework can clarify thought regarding the relationship between logistics, strategy and tactics by enforcing the notion that strategic and tactical planning is incomplete without incorporating logistics considerations as the means to employ operational forces. The framework is an instrument for changed thinking by offering a tool that simplifies and organizes the DOD logistics system in a way that makes the system and its purpose easier to grasp. The tool enlightens by helping the reader think about the essential elements of DOD logistics activities. Describing the fundamental elements of the logistics system may help the reader realize for example that the resources of people, equipment and funding not only enables the system but limits it as well. Grasping the reality of limited resources provides the reader a better perspective with which to plan.

As a consequence, the reader is better able to assess if plans are logistically feasible. The framework helps the reader link the means with ends by describing the system's output products and capabilities that serve as the means that enable the generation and sustainment of combat power. The system's output of materiel, services, facilities, equipment and expendables, coupled

with the system's ability to adapt and respond effectively across the full range of military operations provides the war fighter the necessary means they need to execute an operational plan of action. The framework's description of how these products and capabilities are produced and delivered to operational forces can provide the reader with a healthier awareness for the scope, difficulty of effort and limitations that may hinder desired results. The reader can then reason whether a plan is logistically feasible by considering how resource limitations may affect outcome.

In closing, the basic dilemma the planner faces, as noted by RADM Henry Eccles, in his book Logistics in the National Defense, is how to achieve the maximum over-all combat effectiveness within the limitations imposed by resources.[3] Better awareness of logistics limitations help the planner and the commander balance means with ends. The framework provides the planner a perspective that shows how finite resources restrict strategic and tactical planning. This perspective helps the commander better assess how to use available resources to achieve the desired planning goals and objectives. Eccles ties it together when he states "the commander's strategic and tactical plans depend on his logistics capabilities, all three must be modified in accordance with a single integrated intellectual process—the mind of command." [4]

Notes

[1] Bartlow, Col Gene S. "The Operator-Logistician Disconnect." *Airpower Journal*, (Fall 1988): 23-37. On-line. Internet, 8 March 2002. Available from http://www.airpower.au.af.mil/airchronicles/apj/apj88/bartlow.html. Pgs 1-11.

[2] Bartlow. Pg 2.

Notes

[3] Eccles, RADM (Ret) Henry E. *Logistics in the National Defense.* Harrisburg, Pennsylvania: The Stackpole Company, 1959. Reprinted. Newport, Rhode Island: Naval War College Press, 1997. Pg 194.

[4] Eccles, Pg 209.

Chapter 4

Conclusions

The successful commander, in modern warfare, must keep in mind the ever-present problem of logistics.

—Major General Elmer D. Adler, USAAF

This paper serves as a primer for logistics education. It offers a tool that describes a framework of the DOD logistics system that provides meaningful insights, influences planning and facilitates more informed decision-making. Its intended audience is the field grade officer or DOD civilian equivalent attending joint professional military education. It is therefore recommended that this paper be used in part or in whole to introduce joint officers and DOD civilians to the profession of logistics. Specifically, it is recommended that the paper be included in the resident and non-resident curriculums for joint education at all intermediate- or senior-level professional military education institutions.

It is the author's hope that this document will provide a broad overarching framework to set the stage for further logistics discussion and education by helping the reader better understand DOD logistics and how it influences military operations.

Appendix A

Principles of Logistics

Principles function as a guiding vector for the commander. They may be considered as tentative prescriptions that serve as general guidelines rather than unchangeable laws or maxims.[1] Though not exhaustive, the two lists below offer some useful insights on logistics principles for modern warfare. The first list, taken from Joint Publication 4-0, shows the current set of logistics principles offered to combatant commanders and their staffs for consideration while planning and executing logistics support for joint operations.[2] The second list, offered by James A. Huston in his book The Sinews Of War: Army Logistics, 1773-1953, are principles drawn from 175 years of U.S. ground warfare experiences.[3]

Joint Publication 4-0

Responsiveness The right support in the right quantity in the right place at the right time.

Simplicity The need to reduce complexity.

Flexibility The ability to adapt logistics structures and procedures to changing situations, missions and concepts of operations.

Economy Using the fewest resources at the least cost and within acceptable levels of risk.

Attainability The ability to provide the minimum essential supplies and services required to begin combat operations.

Sustainability A measure of the ability to maintain logistics support to all users throughout the theater for the duration of the operation.

Survivability The capacity of the organization to prevail in the face of potential destruction.

Notes

[1] Huston, James A. *The Sinews of War: Army Logistics, 1775-1953.* Washington, D.C.: U.S. Government Printing Office, 1966. Pg 655.

[2] Joint Publication (JP) 4-0. *Doctrine for Logistic Support of Joint Operations.* 6 April 2000. Pg II-2.

[3] Huston. Pgs 655-668.

The First With the Most The ability to deliver firepower or shock to the critical places at the critical times to achieve objectives.

Equivalence Strategy, tactics and logistics are of equal importance.

Materiel Precedence Mobilization of combat service support forces should precede that of combat forces.

Economy Logistics resources have limits.

Dispersion Disperse logistics activities. Use multiple lines of communication and sources of supply to minimize losses from enemy action and to ease congestion of logistics activities.

Flexibility Preparedness to support a multitude of different plans or decisions and to support changes thereof.

Feasibility The "the art of the possible" to achieve military objectives where capabilities of the national economy, availability of other resources and the limitation of secondary requirements affect strategic and tactical planning.

Civilian Responsibility Production of military goods relies on private industry.

Continuity Continuous effort to perfect logistics activities and produce essential equipment should exist during peacetime so no fundamental change is necessary in war.

TimingTiming must relate to the objective to anticipate requirements and to avoid overages and shortages.

Unity of Command A single authority, equal to command, should be responsible for logistics.

Forward Impetus The details the commander must deal with to support forward operations should be minimized to the greatest extent possible without degrading his control of logistics.

Information Accurate, current information is vital to effective logistics.

Relativity All logistics is relative to time, place and circumstance.

Appendix B

DOD Senior Logistician Roles and Responsibilities[1]

Deputy Under Secretary of Defense, Logistics and Materiel Readiness

The Deputy Under Secretary of Defense for Logistics and Materiel Readiness is the principal logistics official within the senior management of the Department of Defense. As such, he or she: prescribes policies and procedures for the conduct of logistics, maintenance, materiel readiness and sustainment support in the Department of Defense, to include supply and transportation; advises and assists the Under Secretary of Defense (Acquisition, Technology & Logistics) and the Secretary and Deputy Secretary of Defense in providing guidance to the Secretaries of the military departments with respect to logistics, maintenance, materiel readiness and sustainment support in the Department of Defense; monitors and reviews all logistics, maintenance, materiel readiness and sustainment support programs within the Department of Defense; and participates in the Department of Defense Planning, Programming and Budgeting System with respect to assigned areas of responsibilities.[2]

Director for Logistics, J4, The Joint Staff

The Director for Logistics provides assistance to the Chairman of the Joint Chiefs of Staff by:establishing joint logistics doctrine; providing logistics parameters for strategic and contingency plans development;developing logistics, environmental, mobility and mobilization annexes in support of strategic and contingency plans;maximizing the logistics capabilities of the combatant commands, to include developing strategic mobility, mobilization, medical readiness, civil engineering and sustainment polices and procedures to support combat forces;

maintaining a logistics and mobility asset prioritization capability for contingency operations; performing logistic requirements in Planning, Programming, Budgeting System (PPBS), to include developing alternative budget recommendations; planning and providing guidance for the logistics aspects of security, humanitarian and disaster assistance and support to the civil emergency agencies; reviewing the logistics and mobilization plans and programs of the combatant commands to determine their adequacy; providing guidance to the military services and combat support agencies for the preparation of their respective logistics and mobilization plans; establishing combined logistics strategy, doctrine and plans; operating a Logistics Readiness Center (LRC);and integrating logistics information systems requirements across joint programs and between logistics and other combat support functional areas.[3]

Deputy Chief of Staff of the Army, Logistics

The Deputy Chief of Staff of the Army for Logistics is responsible for policy, planning, programming, budgeting, management, staff supervision, evaluation, oversight and information system support for logistics activities of the Department of the Army.[4]

Deputy Chief of Naval Operation, Fleet Readiness and Logistics

The Deputy Chief of Naval Operation for Fleet Readiness and Logistics supports and advocates readiness to meet the needs of the war fighter with a cohesive overarching strategy that: plans and sets Fleet Readiness and Logistics requirements; aligns resources within sponsored programs;ensures the continuous design, development and integration of Naval logistics functions to ensure fleet readiness;develops and coordinates Navy logistics policy;

and ensures compliance with policy and effective utilization of resources to meet requirements.[5]

Deputy Chief of Staff of the Marine Corps, Installation and Logistics

The Deputy Chief of Staff of the Marine Corps for Installation and Logistics acts on behalf of the Commandant in designated matters of logistics policy and management and coordinates logistics actions with other agencies.[6]

Deputy Chief of Staff of the Air Force, Installation and Logistics

The Deputy Chief of Staff of the Air Force for Installation and Logistics develops policy and provides resources to deliver effective agile combat support across the full spectrum of expeditionary aerospace force.[7]

Director, Defense Logistics Agency

The Director of the Defense Logistics Agency provides effective and efficient worldwide logistics support to the military departments and the unified and specified commands under conditions of peace and war, as well as to other DOD components, federal agencies, foreign governments, or international organizations as assigned. This support includes: the provision of materiel commodities and items of supply that have been determined, through the application of approved criteria, to be appropriate for integrated management by a single agency on behalf of all DOD Components, or that have been otherwise specifically assigned by appropriate authority; the performance of logistics services directly associated with furnishing materiel commodities and items of supply; and the administration of Department-wide logistics management systems, programs and activities, as assigned, including the provision of technical assistance, support services and information. [8]

Deputy Commander, United States Transportation Command

The Deputy Commander of United States Transportation Command provides air, land and sea transportation for the Department of Defense, both in time of peace and time of war.

Additional responsibilities include: providing management support for military service-unique or theater assigned transportation assets to the Secretaries of the military departments and the commanders of unified and specified Commands; making recommendations for acquisition on the capability, capacity, characteristics, design and other requirements for mobility assets needed to execute its mission; and establishing and maintaining relationships between the Department of Defense and the commercial transportation industry to develop concepts, requirements and procedures for the Contingency Response Program, the Civil Reserve Air Fleet and the Sealift Readiness program.[9]

Notes

[1] Members of the Joint Logistics Board (formerly Logistics Reform Senior Steering Group): US Department of Defense. *Logistics Transformation Update, Focus and Accelerate.* Washington, D.C.: Office of the Deputy Under Secretary of Defense for Logistics and Materiel Readiness, January 2001. On-line. Internet, 8 March 2002. Available from http://www.acq.osd.mil/log/programs/logtransformation/log_trans-formation.pdf. Pg 2-1.

[2] US Department of Defense (DoD) Directive 5134.12. *Deputy Under Secretary of Defense for Logistics and Materiel Readiness (DUSD (L&MR)).* 25 May 2000. On-line. Internet, 8 March 2002. Available from http://www.dtic.mil/whs/directives/corres/pdf/d513412_052500/d513412p.pdf.

[3] US Department of Defense. *Mission.* Washington, D.C.: Office of the Joint Chiefs of Staff Logistics Directorate (J4), 9 August 2000. On-line. Internet, 8 March 2002. Available from http://www.dtic.mil/jcs/j4/about.html.

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[4] US Department of the Army. *Mission Statement, Deputy Chief of Staff, Logistics*. Washington, D.C.: Office of the Deputy Army Chief of Staff for Logistics. On-line. Internet, 8 March 2002. Available from http://www.hqda.army.mil/logweb/sitemap/odcslog/mission/odcslog_mission_statement.htm.

[5] US Department of the Navy. *Mission Statement, Deputy Chief of Naval Operations, Fleet Readiness and Logistics*. Washington, D.C.: Office of the Deputy Chief of Naval Operations for Fleet Readiness and Logistics. On-line. Internet, 8 March 2002. Available from http://ucso2.hq.navy.mil/n4/webbas01.nsf/(vwwebpage)/webbase.htm/OpenDocument.

[6] US Department of the Navy. *Mission Statement, Deputy Commandant, Installation and Logistics*, Washington, D.C.: Office of the Deputy Commandant, Installation and Logistics, United States Marine Corps. On-line. Internet, 8 March 2002. Available from http://www. hqmc.usmc.mil/ilweb.nsf.

[7] US Department of the Air Force. *Mission Statement, Deputy Chief of Staff for Installation and Logistics*, Washington, D.C.: Office of the Deputy Air Force Chief of Staff for Installation and Logistics. On-line. Internet, 8 March 2002. Available from http://www.il.hq.af.mil/.

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[8] US Department of Defense (DoD) Directive 5105.22. *Defense Logistics Agency*. 6 Dec 88. On-line. Internet, 8 March 2002. Available from http://www.dtic.mil/whs/directives/corres/pdf/d510522_120688/d510522p.pdf.

[9] US Department of Defense (DoD) Directive 5158.4. *United States Transportation Command*. 8 January 1993. On-line. Internet, 8 March 2002. Available from http://www.dtic.mil/whs/directives/corres/pdf/d51584_010893/d51584p.pdf.

Appendix C

Theater Logistics System[1]

The Theater logistics system is made up of five key elements as defined in Joint Publication 4-0. Each is briefly described below.

Lines of Communication All the routes (land, water and air) that connect an operating military force with a theater base of operations and along which supplies and military forces move.

Theater Transportation Network The airports, seaports, bases, railheads, pipeline terminals and trailer transfer points that provide line of communication reception and trans-shipment points.

Units The activities that operate the theater transportation network facilities.

Host Nation, Allied and Coalition Support The desired civil and military assistance from allies that includes: en route support, reception, onward movement and sustainment of deploying forces.

Contingency Contracting Contracting performed in support of a contingency in an overseas location pursuant to the policies and procedures of the Federal Acquisition Regulatory system. Contractor support may be provided in the areas of facilities, supplies, services, maintenance, transportation and quality of life support.

Notes

[1] Joint Publication (JP) 4-0. *Doctrine for Logistic Support of Joint Operations.* 6 April 2000. Pg IV-2.

Glossary [1]

Adaptability. The ability of the system to adjust to a specified use or condition. It incorporates the ideas of scaling or tailoring logistics to meet specific (precise) user needs.

Assembly Area.* An area in which a command is assembled preparatory to further action.

Capability.* The ability to execute a specified course of action.

Civil Engineering.* Those combat support and combat service support activities that identify, design, construct, lease, or provide facilities and which operate, maintain and perform war damage repair and other engineering functions in support of military operations.

Combatant Command.* A unified or specified command with a broad continuing mission under a single commander established and so designated by the President, through the Secretary of Defense and with the advice and assistance of the Chairman of the Joint Chiefs of Staff. Combatant commands typically have geographic or functional responsibilities.

Combatant Commander.* A commander in chief of one of the unified or specified combatant commands established by the President. Also called CINC.

Combat Service Support.* The essential capabilities, functions, activities and tasks necessary to sustain all elements of operating forces in theater at all levels of war. Within the national and theater logistic system, it includes but is not limited to that support rendered by service forces in ensuring the aspects of supply, maintenance, transportation, health services and other services required by aviation and ground combat troops to permit those units to accomplish their missions in combat. Combat service support encompasses those activities at all levels of war that produce sustainment to all operating forces on the battlefield.

Command.* The authority that a commander in the Armed Forces lawfully exercises over subordinates by virtue of rank or assignment. Command includes the authority and responsibility for effectively using available resources and for planning the employment of, organizing, directing, coordinating and controlling military forces for the accomplishment of assigned missions. It also includes responsibility for health, welfare, morale and discipline of assigned personnel.

Command and Control.* The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities and procedures employed by a commander in planning, directing, coordinating and controlling forces and operation in the accomplishment of the mission.

Command and Control System.* The facilities, equipment, communications, procedures and personnel essential to a commander for planning, directing and controlling operations of assigned forces pursuant to the mission assigned.

Concept of Operations.* A verbal or graphic statement, in broad outline, of a commander's assumptions or intent in regard to an operation or series of operations. The concept is designed to give an overall picture of the operation. It is included primarily for additional clarity of purpose.

Cost Effectiveness. The relationship between the cost of logistics support and the effectiveness of that support. Brings into question the issue of affordability relative to capability where a balance should exist to ensure the right level of capability is achieved at an acceptable cost.

Deployment.* The relocation of forces and materiel to desired operational areas. Deployment covers all activities from origin or home station to through destination, specifically including intra-continental United States, inter-theater and intra-theater movement legs, staging and holding areas.

Disposition (Evacuation).* The process of moving any person who is wounded, injured, or ill to and/or between medical treatment facilities; the clearance of personnel, animals, or materiel from a given locality; the controlled process of collecting, classifying and shipping unserviceable or abandoned materiel, US or foreign, to appropriate reclamation, maintenance, technical intelligence, or disposal facilities.

Distribution system.* That complex of facilities, installations, methods and procedures designed to receive, store, maintain, distribute and control the flow of military materiel between the point of receipt into the military system and the point of issue to using activities or units.

Doctrine.* Fundamental principles by which the military forces or elements thereof guide their actions in support of national objectives. It is authoritative but requires judgment in application.

Equipment.* In logistics, all non-expendable items needed to outfit or equip an individual or organization.

Expendable supplies and materiel.* Supplies which are consumed in use, such as ammunition, paint, fuel, cleaning and preserving materials, surgical dressings, drugs, medicines, etc., or which lose their identity such as spare parts, etc.

Facility.* A real property entity consisting of one or more of the following: a building, a structure, a utility system, pavement and underlying land.

Feasibility.* The determination as to whether the assigned tasks could be accomplished by using available resources.

Functions.* The appropriate or assigned duties, responsibilities, missions, or tasks of an individual, office, or organization. As defined in the National Security Act of 1947, as amended, the term "function" includes functions, powers and duties (5 United States Code 171n(a)).

Garrison Force.* All units assigned to a base or area for defense, development, operation and maintenance of facilities.

Interoperability.* The ability of the system to effectively operate among multiple organizations. It demands that logistics processes be fully integrated among the military Services, allied armed forces, government organizations and agencies, non-government organizations and agencies and private industry to take advantage of what each can offer to make the system more efficient and more effective.

Logistic Support.* Logistic support encompasses the logistic services, materiel and transportation required to support the continental United States-based and worldwide-deployed forces.

Logistics.* The science of planning and carrying out the movement and maintenance of forces. In its most comprehensive sense, those aspects of military operations which deal with: design and development, acquisition, storage, movement, distribution, maintenance evacuation and disposition of materiel; movement, evacuation and hospitalization of personnel; acquisition or construction, maintenance, operation and disposition of facilities; and acquisition or furnishing of services.

Maintenance (Materiel).* All action taken to retain materiel in a serviceable condition or to restore it to serviceability. It includes inspection, testing, servicing, classification as to

serviceability, repair, rebuilding and reclamation; all supply and repair action taken to keep a force in condition to carry out its mission; and the routine recurring work required to keep a facility (plant, building, structure, ground facility, utility system, or other real property) in such condition that it may be continuously used, at its original or designed capacity and efficiency for its intended purpose.

Materiel.* All items (including ships, tanks, self-propelled weapons, aircraft, etc. and related spares, repair parts and support equipment, but excluding real property, installations and utilities) necessary to equip, operate, maintain and support military activities without distinction as to its application for administrative or combat purposes.

Mortuary Affairs.* Covers the search for, recovery, identification, preparation and disposition of remains of persons for whom the Services are responsible by status and Executive Order.

Operation.* A military action or the carrying out of a strategic, tactical, service, training, or administrative military mission; the process of carrying on combat, including movement, supply, attack, defense and maneuvers needed to gain the objectives of any battle or campaign.

Operational Level of War.* The level of war at which campaigns and major operations are planned, conducted and sustained to accomplish strategic objectives within theaters or operational areas. Activities at this level link tactics and strategy by establishing operational objectives needed to accomplish the strategic objectives, sequencing events to achieve the operational objectives, initiating actions and applying resources to bring about and sustain these events. These activities imply a broader dimension of time or space than do tactics; they ensure

the logistics and administrative support of tactical forces and provide the means by which tactical successes are exploited to achieve strategic objectives.

Planning. The process of formulating an approach for contingencies that can be reasonably anticipated for the conduct of military operations by the combatant commanders in response to requirements established by the Chairman of the Joint Chiefs of Staff.

Procurement and Contracting. The process of obtaining needed combat equipment, supplies, services and expendables from various sources of supply such as commercial or private industry or government agencies.

Programming. The process where information in the Defense Planning Guidance is translated into a financial plan of effective and achievable packages (programs) to provide the combatant commander tactical support forces.

Port of Debarkation.* The geographic point at which cargo or personnel are discharged. This may be a seaport or aerial port of debarkation; for unit requirements, it may or may not coincide with the destination.

Port of Embarkation.* The geographic point in a routing scheme for which cargo or personnel depart. This may be a seaport or aerial port from which personnel and equipment flow to a port of debarkation; for unit and non-unit requirements, it may or may not coincide with the origin.

Readiness.* The ability of US military forces to fight and meet the demands of the national military strategy. Readiness is the synthesis of two distinct but interrelated levels: Unit readiness—the ability to provide capabilities required by the combatant commanders to execute their assigned missions. This is derived from the ability to each unit to deliver the outputs for

which it was designed; and Joint Readiness—The combatant commander's ability to integrate and synchronize ready combat and support forces to execute his or her assigned missions.

Redeployment.* The transfer of forces and materiel to support another joint force commander's operational requirements or to return personnel, equipment and materiel to home and/or demobilization stations for re-integration and/or out-processing.

Requisition.* An authoritative demand or request especially for personnel, supplies, or services authorized but not made available without specific request.

Responsiveness. The ability of the system to fulfill requirements when, where and how needed. A responsive system provides operational forces with rapid or immediate reaction to needs and the ability to quickly and easily mobilize, deploy, maneuver and re-deploy.

Staging Area.* A general locality established for the concentration of troop units and transient personnel between movements over the lines of communications. A general locality between the mounting area and the objective of an amphibious or airborne expedition, through which the expedition or parts thereof pass after mounting, for refueling, regrouping of ships and/or exercise, inspections and redistribution of troops.

Strategic Level of War.* The level of war at which a nation, often as a member of a group of nations, determines national or multinational (alliance or coalition) security objectives and guidance and develops and uses national resources to accomplish these objectives. Activities at this level establish national and multinational military objectives; sequence initiatives; define limits and assess risks for the use of military and other instruments of national power; develop global plans or theater war plans to achieve these objectives; and provide military forces and other capabilities in accordance with strategic plans.

Supplies.* All materiel and items used in equipment, support and maintenance of military forces.

Supply.* The procurement, distribution, maintenance while in storage and salvage of supplies, including the determination of kind and quantity of supplies: Producer Phase—That phase of military supply which extends from determination of procurement scheduled to acceptance of finished supplies by the military Services; Consumer Phase—That phase of military supply which extends from receipt of finished supplies by the military services through issue for use or consumption.

Survivability.* The concept of protecting personnel, weapons and supplies while simultaneously deceiving the enemy. That is, the ability of the system to withstand external and internal assaults. Redundancy, dispersal, force protection and other forms of passive and active defense are used to minimize external threats. Sound discipline, training and leadership are used to negate internal assaults such as apathy that results from low morale, neglect, lack of concern or interest, or consequences of long-term under funding.

Sustainment.* The provision of personnel, logistic and other support required to maintain and prolong operations or combat until successful accomplishment or revision of the mission or of the national objective.

Tactical Level of War.* The level of war at which battles and engagements are planned and executed to accomplish military objectives assigned to tactical units or task forces. Activities at this level focus on the ordered arrangement and maneuver of combat elements in relation to each other and to the enemy to achieve combat objectives.

Transportation System.* All the land, water and air routes and transportation assets engaged in the movement of US forces and their supplies during peacetime training, conflict, or

war, involving both mature and contingency theaters and at the strategic operational and tactical levels of war.

Notes

[1] Asterisk indicates definition from Joint Publication (JP) 1-02. *DOD Dictionary of Military and Associated Terms*, 12 April 2001.

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